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Plasmodium Gallinaceum, a Malarial Parasite of the Domestic Fowl

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Although malarial parasites of the family Plasmodiidae are such important causes of disease in man and although a considerable number of species have been described in various wild birds and in monkeys, there are very few records of them in the domestic animals.

A malarial parasite of the buffalo (*P. bubalis*) has been described by Sheather (1919) in India, but it does not appear to be common nor a very important cause of disease in the buffalo. Castellani and Chalmers (1910, 1913) reported that in one slide of blood from a horse and in one slide of blood from a dog, both collected in Colombo, Ceylon, they saw malarial parasites and named them *P. equi* and *P. canis* respectively. These reports have not been confirmed by any other observer. I myself have examined the blood of very many sick horses and sick dogs in Colombo and other parts of Ceylon during the past 20 years and have never seen any malarial parasites and it is probable that Castellani and Chalmers' reports were made in error.

An account of the malarial parasite of the fowl may be of interest since, apart from the fact that this parasite is pathogenic for domestic fowls, it has proved to be of the very greatest value as experimental material for laboratory research into human malaria, especially in the chemotherapy of that disease.

HISTORICAL

In 1910 Dr. Broussais saw a malarial parasite in fowls at Nhatrang in Indo-China, and while on leave in Paris gave Professor Brumpt one slide of blood from a fowl showing a heavy infection. In 1912 Prowazek recorded the finding of a malarial parasite in the blood of domestic fowls at Deli in Sumatra. In 1918, at the request of Professor Brumpt, the blood of 183 fowls at Hanoi in Indo-China was examined by Mathis and Léger with negative results. In 1929, again at the request of Professor Brumpt, about 150 fowls were examined by Sauvel at Nhatrang in Annam, and at Pnom-Penh in Cambodia, with similar negative results.

In 1933 I investigated an outbreak of disease in Colombo affecting fowls recently imported from England and found that the disease was due to a malarial parasite which was present in large numbers in the red corpuscles. Subsequently a number of other outbreaks were seen. In all cases they occurred in poultry yards soon after fowls had been imported from Great Britain. This finding was reported in the Annual Administration Report of the Government Veterinary Surgeon, Ceylon, for the year 1933. I erroneously called the parasite *P. praecox*. An abstract of this report appeared in the *Veterinary Bulletin* in 1934 and was noticed by Professor Brumpt.

In 1935 Professor Brumpt described the parasite from the single slide which had been given to him by Dr. Broussais in 1910. Brumpt considered it to be a new species on account of its morphology and because it was known that the domestic fowl was not susceptible to infection by any of the well-known malarial parasites of wild birds.

In the same year Brumpt toured Indo-China and other parts of the Far East but was unable to find the parasite. On his way back to France, remembering the abstract which he had seen in the *Veterinary Bulletin*, he decided to interrupt his journey for a few days at Colombo. When he arrived in Colombo he got in touch with me, told me of the abstract which he had seen, and asked to be shown the parasite. Unfortunately, at that time there were no outbreaks on hand. Slides from previous outbreaks were shown to Professor Brumpt and he satisfied himself that the parasite was a true plasmodium, and had not been confused with Haemoproteus, a mistake which one got the impression Professor Brumpt rather suspected might have occurred. Satisfied on that point, Professor Brumpt was very anxious to obtain some fowls infected with the parasite. I asked him why he attached so much importance to this particular parasite. He explained that a malarial parasite which would infect such a cheap, hardy and easily obtained subject as the domestic fowl would be of the very greatest value for laboratory use by research workers on the problem of human malaria. At that time the only malarial parasites suitable for laboratory experiments were certain parasites of wild birds. Canaries could be infected with these parasites but canaries were by no means ideal for the purpose: they were expensive, difficult to obtain in large numbers, the housing of large numbers presented difficulties as each canary required considerable cage space, they were delicate birds not very tolerant of frequent handling, and the infections produced in them by the then known parasites were irregular. When these considerations were pointed out it was easy to understand Professor Brumpt's anxiety to obtain infected fowls.

To find such birds at short notice proved to be no easy matter. At the time we had no outbreaks of the disease on hand and only a few days were available before Professor Brumpt's ship sailed. The best that could be done was to go to two poultry yards where outbreaks had occurred previously and to search there for infected birds. We were able to interest the owners, Mrs. R. Marrs and Mrs. F. Jones, and they proved to be most helpful and co-operative. The blood of a large number of their birds was examined microscopically and Mr. Burt, Professor of Zoology at the University College, Colombo, helped to get this done rapidly. The search proved fruitless and Professor Brumpt could delay no longer. In these circumstances a selection of birds from each yard was made, including a few which had been imported from Great Britain and which were definitely known to have suffered and recovered from malaria, soon after arrival in Ceylon. Some 16 birds were selected, travelling coops hurriedly prepared, a supply of food provided and the birds were transported to the harbour. Here a fresh difficulty arose as the ship's purser did not look with favour on such unusual passengers and objected to their being taken on board. This dilemma was vigorously tackled by Professor Brumpt and all objections were finally overcome.

The fowls arrived safely in Paris and some of them proved to be carriers of the parasite. French fowls were readily infected with the parasite by inoculation of blood and very serious and often fatal infections resulted. The strain was established in Professor Brumpt's laboratory and from there it has been distributed to many other laboratories in Great Britain and America. Among those supplied was Lieut.-Colonel James, of the Molteno Institute, Cambridge.

In 1937 James recorded the discovery of a new stage in the life cycle of the parasite. This stage occurs outside the red corpuscles of the blood in the reticulo-endothelial cells of the spleen, liver and kidneys and especially in the endothelial cells lining the capillaries of the brain. This stage of the parasite is of large size, so large that the endothelial cells in which it develops become grossly enlarged and project into the capillaries, occluding them and blocking the flow of blood. The publication of these findings aroused great interest and was the starting point of many researches. It seemed reasonable to suppose that if such a stage occurred in the parasite of fowl malaria a similar stage might be present in the parasites which cause human malaria. If such a stage did exist it would throw much light on the problem of relapses in human malaria.

Professor Brumpt's hopes that this parasite of fowls would prove to be of great assistance to research workers on human malaria have been fully realised. Experiments on the chemotherapy of malaria have been greatly facilitated and are to-day being carried out on a scale not previously possible.

The history of how this parasite has been made available to research laboratories has been dealt with in some detail as it underlines some useful lessons. First of all there is the persistence of Professor Brumpt. From 1910, when he was first shown the parasite in a blood film and recognised its possible value, he continued to keep it in mind and to make efforts to obtain it. Having obtained it in 1935 he made it available to workers in other countries. Then there is the fact that a comparatively unimportant observation in the veterinary field may prove to be of considerable value in research into human disease. The value of recording such observations is illustrated. The importance of a good abstracting journal with a wide circulation is clearly shown. If the note in the Annual Administration Report of the Government Veterinary Surgeon, Ceylon, for 1933 had not been abstracted by the *Veterinary Bulletin* it is most unlikely that Professor Brumpt would ever have learned of the existence of this parasite in Ceylon.

OCCURRENCE OF THE PARASITE IN NATURE

The geographical distribution is curiously restricted. So far, the only records of the parasite are from Indo-China, Sumatra and Ceylon, and probably India (Shortt *et al.*, 1941). In Ceylon it seems to be restricted to certain localities in the low country wet zone.

The natural host of the parasite is not known for certain but it is reasonable to assume that it may be the wild jungle fowl. The jungle fowl of Ceylon (*Gallus lafayetti*) is a different species from the jungle fowl of India (*Gallus bankiva*) and does not occur in India. The jungle fowl of Sumatra (*Gallus sonnerati*) is again a different species. I have examined the blood of a small number of jungle fowl in Ceylon, all healthy birds shot in the jungle, without finding the parasite. If the jungle fowl is the natural host it is probable that it has a high degree of immunity and the likelihood of finding heavy infections in chance-shot wild specimens would be remote. Shortt *et al.* (1941) found a malarial parasite in one out of 40 jungle fowl in the area around Madras and successfully transmitted the infection to domestic fowls. They consider the parasite to be identical with *P. gallinaceum*, this opinion being based on morphological grounds and on cross immunity tests.

When outbreaks have come to notice in Ceylon they have always been in poultry yards where fowls have been imported from Great Britain. Such imported birds often suffer from intense infections, more than 80 per cent. of the red corpuscles being parasitised. Such infections generally terminate fatally after a very short period of illness. Unless the cause of the deaths is recognised and appropriate treatment of all recently imported birds is adopted, losses may be heavy. Fowls of the native Ceylon breeds kept in the same yards seldom or never show any symptoms and appear to be perfectly healthy while the recently imported birds are dying. I have only on one occasion seen a fowl of the Ceylon native breed which showed a heavy infection. Fowls of that breed generally resist experimental infection completely or develop a very light infection with few or no symptoms. Chickens of European breeds hatched in Ceylon are easily infected experimentally.

In experimental infections young chicks are more severely infected than older birds. In work done in Ceylon, using chickens of the White Leghorn and Rhode Island Red breeds, the former appeared to be more severely affected. One is tempted to speculate whether the greater susceptibility of the White Leghorn may possibly be due to the fact that it is supposed to have originated around the shores of the Mediterranean Sea, while the Rhode Island Red is one of the Asiatic group.

Symptoms

The cases which I have seen in imported fowls soon after their arrival in Ceylon fall into three groups :—

(1) Very acute cases. A bird previously well is found huddled up in a corner with the face and comb highly congested. The bird gets rapidly worse and dies in a very short time. Examination of the blood shows an intense infection, over 80 per cent. of the corpuscles being parasitised.

(2) Less acute cases characterised by paleness of the face and comb, loss of condition and greenish diarrhoea.

(3) Cases showing paralysis. These cases are less numerous and are generally seen in birds which have appeared to recover from an acute attack after treatment with quinine.

Young chicks experimentally infected in the laboratory do not show any very typical symptoms, except that they are dull and sleepy-looking for a few hours before death. Chicks which have been treated with quinine at the time when the parasites are numerous in the blood stream recover in so far as the parasite disappears from the blood stream, but many of them subsequently develop paralysis and die. This paralysis is caused by blocking of the capillaries of the brain by a heavy infection of the living cells of the capillaries with the large form of the parasite which James has called the exo-erythrocytic stage. Paralysis also occurs, but much less frequently, in adult birds whose blood infection has been cleared up by treatment with quinine. Thus while quinine is effective against those forms of the parasite which occur in the red blood corpuscles it is ineffective against the exo-erythrocytic forms.

P.M. Findings

The most important findings are enlargement and dark colour of the spleen and a collection of clear yellow fluid in the pericardial sac. Haemorrhages may be found in the myocardium.

Morphology of the Parasite

The morphology of the stages which are found in the red blood corpuscles and in the stomach of the mosquito has been described by Brumpt (1935). These stages correspond with those in other Plasmodiidae. The merozoites vary in number from 8 to 30. The microgametocytes are coloured red and the macrogametocytes blue in Giemsa-stained films. The nucleus of the parasitised red corpuscle is displaced to one side and appears to be denser and more deeply stained than the nucleus of a normal corpuscle.

The exo-erythrocytic forms found in monocytes and in reticulo-endothelial cells of the spleen, liver and kidneys and especially in the endothelial cells of the capillaries of the brain, are very large schizonts containing up to 50 or 60 or even more merozoites. Unlike the schizonts found in the red blood corpuscles they are never pigmented.

Pathogenicity

Fowls of all breeds, except those of the Ceylon native breeds, are readily infected experimentally either by inoculation of blood or by the bite of an infected mosquito. Brumpt (1936) has shown that severe, sometimes fatal, infections can be obtained experimentally in geese and pheasants. When turkeys are injected with infected blood occasional parasites may be found in the blood for a short period. Feeble and temporary infections can be set up in peafowl and partridges. Ducks, pigeons, doves, canaries and a number of wild birds have been shown to be completely resistant to infection.

The parasite persists in a recovered bird for as long as two years, probably longer. The period elapsing between inoculation with infected blood and the appearance of parasites in the blood stream is very regularly from six to nine days. Even when the blood stream is very heavily infected there is no rise of temperature.

Transmission

Brumpt (1936) showed that the mosquito *Culex fatigans* was incapable of transmitting infection. *Stegomyia fasciata* (*Aëdes aegypti*) is very easily infected, develops an intense infection, and readily transmits the disease to healthy fowls. Brumpt was able to infect 100 per cent. of the mosquitoes of this species which he used in his experiments. He showed that *S. albopicta* was also an efficient transmitter.

The fact that *S. fasciata* is such an efficient transmitter is useful in experimental work as this mosquito is very easy to breed under laboratory conditions. *S. fasciata* is a very cosmopolitan and widespread mosquito, a fact which is difficult to reconcile with the very limited geographical distribution of *P. gallinaceum*.

Treatment

In Ceylon when cases have occurred in recently imported fowls we have used quinine in doses up to 5 grains a day for five days. Except in the fulminating cases this treatment is generally successful; along with the quinine it has been usual to give Glauber's salts in the drinking water. It has also been the practice when cases have occurred in a flock, to dose all recently imported fowls with quinine for a few days irrespective of whether they show symptoms or not. Quinine usually prevents the development of paralysis in all except a small proportion of adult birds. The incidence of paralysis in naturally infected adult birds is very much lower than in young chicks infected experimentally in the laboratory.

References

Brumpt, E. (1935.) Paludisme aviaire : *Plasmodium gallinaceum* n. sp. de la poule domestique. *C.R. Acad., Sci.*, Paris, **200**, 783.

———. (1936.) Etude expérimentale du *P. gallinaceum*, parasite de la poule domestique. *Ann. Parasit. hum. comp.*, **14**, 597.

Castellani, A., and Chalmers, A. J. (1910.) Manual of Tropical Medicine. 1st Ed. (Quoted by Wenyon, 1926.) London.

———, ———. (1913.) Manual of Tropical Medicine. 2nd Ed. (Quoted by Wenyon, 1926.)

Crawford, M. (1933.) Admin. Report Govt. Vety. Surgeon, Ceylon. p. 11.

James, S. P., and Tate, P. (1937.) Preparations illustrating the recently discovered cycle of avian malaria parasite in reticulo-endothelial cells. *Trans. R. Soc. trop. Med. Hyg.*, **31**, 1.

———, ———. (1938.) Exo-erythrocytic schizogony in *P. gallinaceum*. Brumpt, 1935. *Parasitology*, **30**, 128.

Sheather, A. L. (1919.) A malarial parasite in the blood of a buffalo. Agr. Res. Inst. Pusa, Bull. No. 90. (Quoted by Wenyon, 1926.)

Shortt, H. E., Menon, K. P., and Iyer, P. V. S. (1941.) *J. Mal. Inst. Ind.*, **4**, 2.

Wenyon. (1926.) Protozoology II. p. 975-6.

MAIZE IN THE AETIOLOGY OF PELLAGRA

The eating of maize (corn) was associated with pellagra as early as 1735, but it was not until the 1930's that the exact role of that cereal grain in the aetiology of pellagra was scientifically demonstrated. Corn is closely associated with the requirement of nicotinic acid, and the feeding of yellow corn actually increases the need for that fraction of the B complex, and therein appears to hinge the explanation of the connection. The investigational work of Krehl, Teply and Elvehjem and of Frost and Elvehjem, University of Wisconsin, clearly proved that growth was retarded by adding yellow corn, white corn, or corn grits to the ration of dogs fed on synthetic rations essentially free from nicotinic acid but otherwise adequate. In short, corn is growth-depressing in the absence of sufficient nicotinic acid to overcome that action, for according to the authors when casein containing 0·005 gm. of nicotinic acid per 100 gm. was increased to 20 per cent. of the ration, the growth-depressing action was diminished.—*Science.*

Ancient and Modern Methods

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Scientists are busily engaged in devising new means of destruction and different authorities at the end of their broadcasts express the hope that the same scientific spirit that is used for the purposes of destruction will be available for those of reconstruction. While science was utilised for destruction in enemy lands, at the same time science was destroying the land of Britain by the excessive use of artificial fertilisers; the soil from which the nation's food and health is derived was losing its fertility. Since road transport and much of the work on the farm has been mechanised the use of such fertilisers has been greatly extended; agricultural experts now realise that a halt will have to be called and more livestock kept on farms to provide natural manure.

Before the introduction of the motor, large quantities of horse manure were available in cities, towns and villages and farmers obtained this manure at a cheap rate—in some cases farmers near large cities were paid to remove it. This source of manure has never been replaced. When horses were used for transport, large quantities of feeding-stuffs for them were imported into this country. It would appear that until the introduction of motor transport, the fertility of the soil of this country was maintained at the expense of the soil of the exporting countries. Over 60 years ago horse owners purchased hay in the rick, delivered at £2 10s. per ton without tops and bottoms, and when hay became scarce and dearer, Canadian baled hay was imported. I have never seen hay to equal it: horses would leave their manger feed consisting of the best procurable crushed oats, beans, Indian corn, bran, cut hay and oaten straw and salt to consume this hay. The hay was the product of virgin soil. What is the position at the present time? The continual cropping without replacement of natural manures and the soil becoming derelict. This is occurring in many parts of the world and governments are getting anxious. The following is an extract from a letter from the Hon. Secretary of the Institute of Sewage Purification: "In regard to your observation on the retention of soil fertility of this country at the expense of the soil of exporting countries, I believe the exporting countries are now getting seriously alarmed at the condition into which their soil has fallen. The number of communications which I have received, from Australia and New Zealand particularly, on this subject confirms this."

During the war the amount of oil cake available for dairy cows was very limited. Apart from its use in milk production, the manurial value of this feeding-stuff is of a very high order. I remember reading a leaflet issued by the Ministry of Agriculture and Fisheries about 40 years ago, in which it was stated that 40 per cent. of the value of the oil cake was returned to the soil in manurial value; the loss of fertility in the soil due to this item alone must be considerable. I am relying on my memory for the accuracy of this statement.

Within the last few days, on reading of the "Indore Process," the following paragraph attracted my attention: "Any available animal manure may be used, but it is important that the urine of the animal be carefully preserved because this contains the drainage of every cell and gland in the animal body and is therefore rich in accessory growth substances." To my personal knowledge the following procedure was in operation 90 years ago and in all probability before that date. I have never seen or heard of the employment of the complete method elsewhere but it may have been a common practice.

The horse stalls were paved with small granite blocks sloping from the manger to the heel posts, from the sides to the centre, and from the outside wall to the gutter behind the horses; only geldings were kept and the possibility of horses slipping was negligible. The stalls and a portion of the standing behind the horses were sprinkled with sawdust and plenty of good wheaten straw was used as bedding. In the day-time when the horses were at work the sawdust impregnated with the urine and any wet straw was transferred to the manure heap. The manure pit was a large, deep pit with the bottom and sides impervious to liquids, and pigs were kept on this heap for the sole purpose of treading down the manure. As long as I can remember I used to watch the farmers loading their carts with the manure and observing the difference in the appearance of the manure the further they got down until the last three feet was a black solid mass. Now one realises this manure must have been very valuable as a fertiliser. Eventually the Public Health Department prohibited the keeping of pigs and finally the manure pit had to be done away with and the manure removed daily. The manurial value of the product of the old method must have been at least twice that of the manure when carted away daily. Now, instead of the occasional fumes of animal manure the people inhale at least ten times the volume of exhaust petrol fumes and unburned oil from motors and are quite happy and, according to reports, healthier. When peat moss began to be used for bedding it was not considered to be as satisfactory as straw and a layer of peat moss was laid on the bottom and straw on the top of it. When peat moss only was used as bedding farmers said the resultant manure was not as good as straw manure and was only fit for top dressing.

In different parts of Britain it is appalling to observe the loss of valuable manure. You find the manure heap without an impervious bottom close to the cowshed and in wet weather a thick dark stream is running from the heap; moreover, on enquiry you are told it runs into the streams. Nature provides for the feeding of fish without man's aid, and man, with his modern sanitation, is beginning at last to realise this and will have to take steps to recover some of the waste that is occurring and by this means help to feed himself instead of feeding fish. If we eat more fish we will obtain nourishment without impoverishing the land and help to recover the balance of Nature. We hear a great deal about the balance of power but the former is as important as the latter. In the modern cowshed, in many cases, the urine is washed down the drains into streams feeding more fish. What is taken from the soil has to be returned to the soil and not sent to the sea. Sometimes the farmers use chaff in the gutters to absorb the urine or at least part of it. In parts of the country there are sawmills near farms and heaps of sawdust. What is to prevent farmers getting this sawdust and using it in their cowsheds and stables to absorb the urine? If some absorbent could be provided for the urine and the manure heap be properly looked after the manurial value of the heap would be enhanced and less artificial fertilisers would be used. After the solid material had been removed from the cowshed the whole standing could be well hosed down and valuable manure saved. At present, in some cases, the farmer is losing an amount of money equivalent to his rent and the resultant manure is of low value.

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One often wonders if, in the supposedly high state of civilisation and education the present generation has reached, we know as much of many conditions as did the ancients. We moderns are apt to sneer at their teachings and practices: we imagine that as they had no powerful microscopes, X-ray apparatus and so on they were ignorant and their treatment merely based upon superstition. According to Biblical history abortion has been known from time immemorial. Jacob seems to have known the secret of its prevention—Genesis, Chap. 31, verse 38: "This twenty years have I been with thee, thy ewes and thy she goats have not cast their young, and the rams of thy flock have I not eaten."

In the London Museum behind St. James's Palace, there is a prehistoric skull about 20,000 years old which has clearly been carefully trepanned, opening up the brain over a surface as large as a shilling. Thus 20,000 years ago the ancients, using stone knives, knew how to open the skull and very likely some primitive form of antisepsis was used and anaesthetics were used thousands of years ago. The ancients knew more about bacteriology than most of us would believe. Vaccination and inoculation are as old as civilisation. They were practised by the Hindus and Chinese thousands of years ago. Many of our most potent herbal and chemical remedies were in use continually from the dawn of history.

At the present time we have heard from the Dumbarton Oaks Conference, and over the wireless, a great deal about diet and health and that prevention is better than cure—as if the present generation had discovered something new. Hippocrates, the Father of Medicine, recognised that prevention is better than cure: herewith a few maxims from "Aphorisms," the most celebrated work of Hippocrates, apparently written about 2,300 years ago:—

"Purgative medicines agree ill with persons in good health; persons in good health quickly lose their strength by taking purgative medicines or by using bad food."

"Neither repletion nor fasting nor anything else is good if carried to excess."

"When more food than is proper has been taken it occasions disease."

It is worth while quoting Hippocrates' views on diet as expressed in his book "Ancient Medicine":—

"To the human body it makes a great difference whether the bread be made of fine flour or coarse, whether of wheat with the bran or without the bran, whether mixed with much water or little water, whether strongly kneaded or little kneaded, whether thoroughly baked or underdone—and a multitude of similar differences. Whoever pays no attention to these things or who pays attention to them without full knowledge cannot understand the diseases which befall man."

The foregoing appears to be a good foundation for the building up of a Public Health System and is equally applicable to animals —for example, the form in which beans or oats should be fed to cows. If stock owners and their veterinary advisers paid attention to these maxims and the laws of Nature the probability is that we would hear less of many of the present-day diseases, some of which were unknown a generation ago.

I have often stated that scientists are rediscovering methods of treatment which our forefathers knew. I mentioned that in my grandfather's time wounds on horses were bathed with salt and water and that during World War No. 1 it was discovered that the best method at that time of treating gunshot wounds was by irrigation with normal saline solution. Undoubtedly irrigation with normal saline solution sounds more dignified and learned than bathing with salt and water.

Nature provides a remedy for all complaints but, so far, man has not acquired sufficient knowledge to enable him to find the remedy in many cases. The methods of the ancients can teach us moderns a great deal and it looks as if the Chinese, the oldest dynasty in the world, who have helped to save our civilisation, will help us to save our agriculture by following some of their customs.

CLINICAL COMMUNICATION

Soluseptasine and Suckling Puppies

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Subject.—A Scottie bitch, aged 14 months.

History.—She whelped seven puppies in five hours without assistance. The last of the foetal membranes was not passed and ½ c.c. of pituitary extract was given. The bitch was not under constant observation and it was presumed that this membrane had been passed later and eaten. In fact, however, it was retained for 24 hours.

The bitch and puppies appeared normal for six days when it was found that one bitch puppy was suffering from diarrhoea and was not suckling. This puppy died on the seventh day and a *post-mortem* examination showed that it was affected with acute peritonitis, a large quantity of bloodstained serous fluid being found in the abdominal cavity.

The other puppies were now affected with diarrhoea, were lethargic and would not suckle. The bitch was found to have a purulent discharge from the vulva.

Diagnosis.—It was considered that the bitch had developed metritis and that the puppies were suffering from enteritis and possibly septicaemia due to the ingestion of some of the purulent discharge which had become smeared on the teats.

Treatment.—The bitch received four tablets of sulphanilamide (May & Baker) followed by two tablets at intervals of four hours. The uterus was irrigated with acriflavine solution and the teats and mammary glands were washed with the same solution.

The six puppies received 1 c.c. of soluseptasine 10 per cent. solution (May & Baker) subcutaneously at intervals of four hours until each puppy had received 5 c.c. After the ninth hour the majority of the puppies resumed suckling and at the twelfth hour all were suckling and vigorous. Diarrhoea was still present but 24 hours after the start of the treatment the faeces returned to normal. Both bitch and puppies made an uneventful recovery.

Conclusion.—The writer is of the opinion that the death of every puppy in this litter would have been inevitable but for the administration of one of the sulphonamide group. The satisfactory results obtained do perhaps demonstrate the vital necessity of observing maximum therapeutic dosage where sulphonamide drugs are concerned, and an illustration of this is to be found in the soluseptasine dosage employed in puppies weighing little more than ½ lb. It is important to add that no toxic symptoms appeared.

It is a matter of interest to the veterinary surgeons concerned and of considerable satisfaction to the Livestock Industry Group, that the New Zealand Government has decided to reduce to one month the existing period of three months' domicile in Canada or Australia of livestock proceeding to New Zealand from Great Britain.

ABSTRACTS

[Abortion Following the Vaccination of Pregnant Cows with Strain 19. Deem, A. W., and Cross, F. (1945.) *J. Amer. vet. med. Ass.* **106**. 213-215.]

It has been shown on several occasions that if strain 19 is inoculated into pregnant animals abortion will occur with typical placental lesions. Strain 19 has also caused orchitis in a bull.

In a large herd of mature animals which were vaccinated with strain 19 when three to four months pregnant, 23 dead and three premature calves were delivered and 31 animals carried their calves to term. A strain of *Br. abortus* identical with strain 19 was isolated from an aborted foetus. In another vaccinated herd there were two abortions and two premature calves. Two strains culturally resembling strain 19 and of low pathogenicity were isolated.

The authors emphasise the danger of using strain 19 indiscriminately.

J. F.

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[Sheep Maggots. Cragg, J. B. (1945.) *J. Min. Agric.* **52**. 161-164.]

Cragg gives a brief summary of our knowledge about sheep maggots and the principal control measures against them. Six types of fly associated with strike occur in Britain, *viz., Lucilia sericata, L. caesar, L. illustris, Calliphora vomitoria, C. erythrocephala* and *Phormia terrae-novae*; the first named is the main pest. No method, yet known, will completely prevent strike, but its incidence can be reduced by good shepherding and by dipping which, if carried out carelessly, may accentuate rather than prevent the trouble. Dipping, even when carried out correctly, will not protect sheep for more than three weeks and in bad seasons frequent dipping may be necessary. Crutching, *i.e.*, shearing, preferably by machine, of all wool on the tail and posterior surfaces of the hind legs, is strongly recommended as a method of preventing tail-strike on lambs. A trial in North Wales showed that of 217 crutched lambs none was struck, whereas of 319 uncrutched lambs 28 were struck. A second trial with 117 crutched lambs gave six animals struck, but with 161 uncrutched lambs 35 were struck. An erroneous belief held by some farmers that crutching disfigured the animals and so lowered their market values was dispelled by the results of these trials. Trapping flies is not considered of real practical value. The author states that when maggots do occur a reliable dressing, which should kill all maggots present in the strike, help to heal the wound, and prevent re-strikes, is an absolute necessity. A dressing largely used in North Wales with good results consists of five parts lysol, four parts commercial carbon tetrachloride, nine parts household paraffin and two parts pine tar oil (steam distilled), all ingredients being measured by volume. For use, one part of this mixture should be added to four parts of water. In use, clip away the wool from the struck area and flood the wound with dressing and gently dab the whole region; dressing should also be poured over the wool that has been clipped off to kill maggots present and which might otherwise burrow into the ground, pupate and become flies. Cragg briefly discusses the possibilities of D.D.T. against the blowflies of sheep.

J. N. O.

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[Attempts to Infect Swine with *Salmonella suipestifer* cultures and Necrotic Material from the Intestinal Tract. Gwatkin, R., and Moynihan, I. W. (1945.) *Canad. J. comp. Med.* **9**. 71-76.]

In the experiments reported here and those previously reported, 14 strains of *S. suipestifer* were employed. One hundred and two pigs were given large doses of culture by mouth. Three died of acute salmonellosis, two as a result of the irritants employed and one, at 24 days, with lesions that were of an early necrotic type. Two other pigs showed lesions when necropsied on the ninth day, but subsequent use of this culture on a large number of pigs suggested that these would have been of a transitory nature. Feeding of necrotic intestines and contents from four pigs produced a transitory illness in one of six pigs fed with these specimens, from which *S. suipestifer* was not recovered.

In view of these results the authors doubt whether *S. suipestifer* is the specific cause of the condition known as necrotic enteritis.

J. F.

Weekly Wisdom

"*It is the discrepancy which teaches, if you would learn.*"—Sir Patrick Manson ("the Father of Tropical Medicine")—remark made in 1876 when he made his famous discovery of the diurnal periodicity of microfilariae in human blood in Amoy, China. [*Trans. R. Soc. Trop. Med. and Hyg.* (1945.) **38**. 406.]

THE VETERINARY RECORD

August 25th, 1945

VITAL STATISTICS

IT is admitted that the right of publication and free discussion is essential to intellectual and scientific progress. In an important leading article *The Times*[1] declared that " No single duty imposed upon the new Government is more urgent or more important than the collection and dissemination of the facts upon which public policy must be based. . . . Policy in the future must rest more than ever upon the widest and freest interchange of information between the Government and the community, whose interests they exist to serve, and it is imperative that the war-time habit of official reticence should be promptly and completely abandoned." If this is true of the Government and general public it is even more true of a Government department such as the Ministry of Agriculture and a profession with which it has to work in the closest accord. Unfortunately the habit of official reticence afflicted the Ministry of Agriculture even before the war. Far from being encouraged to contribute to scientific literature it appears that the conditions imposed on veterinary officers make this vital function particularly onerous and there was in fact a great decrease in publication when the Ministry of Agriculture took over the Local Authority services in 1937.[2] It is also unfortunate that permission to publish scientific papers may apparently be refused merely because they impinge on official policy.

Quite apart from the discouragement of individual effort there has, during recent years, been a great lack of official information. We can obtain a very good general picture of the incidence of disease throughout the country for some years after the middle of the last century because during that period John Gamgee, who edited the *Edinburgh Veterinary Review*, collected from practitioners information on the incidence of disease in the Three Kingdoms. He not only collected information but he collated and published it, a task of which some official bodies seem peculiarly shy.

The Disease of Animals Act, 1894, Sec. 50, requires that " The Board of Agriculture shall make and lay before both Houses of Parliament not later than the thirty-first day of March in each year a return stating the proceedings and expenditure under this Act of the Board, and as far as reasonably may be of all local authorities in the year ending the thirty-first day of December then last ; . . . and containing such other information respecting the operation of this Act as the Board think fit." The reports for 1894, 1895 and 1896, which were presented to both Houses as Command Papers, contained detailed statistical information describing the incidence of swine fever, pleuro-pneumonia, foot-and-mouth disease, rabies, anthrax and glanders ; there are also maps showing the incidence of swine fever and rabies, and a survey of diseases in foreign countries, together with figures of the trade in livestock. There are excellent coloured illustrations of the lesions found in swine fever. In the report for 1897 the history and morbid anatomy of pleuro-pneumonia are described and for the first time in 1909 the Chief Veterinary Officer contributed a Laboratory Report, in which an outline was given of the investigations which were conducted in the Board's Veterinary Laboratory during the year. These reports were published until the outbreak of war but instead of their quality improving with the general advance in the presentation of data it can be said that the modern reports compared unfavourably with those published by the Head of the Veterinary Department of the Privy Council. We can obtain a better picture of the disease conditions prevailing in Great Britain 50 or 100 years ago than we can of those prevailing just before the war, and now information is almost completely lacking.

Again, when M'Fadyean carried out tuberculin tests in 1899 and 1900 the results were collated and published so that they were available to all. It is common knowledge that a far more extensive survey was carried out by the Ministry of Agriculture in 1938 and 1939. It may be that the results have been collated and their significance assessed by the responsible officers ; we should have much more confidence of this, however, if the results had been published. There is also much information in official files concerning " Casualties " among farm livestock but it remains unpuplished. The Veterinary Laboratory must have collected an immense amount of information about the diseases of pigs and poultry but there are no adequate reports making this knowledge available. Nearly all the recent work on the immunisation against *Brucella abortus*, foot-and-mouth disease and on tuberculin testing remains unpublished. We fully realise that shortage of paper and other circumstances arising from the war may have hindered the publication of many important reports but it is only just to the reputation of the workers and laboratories concerned, and to the veterinary profession in general, that these additions to scientific knowledge should be published at the earliest opportunity.

As *The Times* says, " At no time has the State possessed so detailed a knowledge of the everyday life and affairs of the nation ; at no time has it been less disposed to share its knowledge with the sovereign people. . . . In every instance the argument (in matters of policy) has been conducted without that indispensable minimum of up-to-date factual knowledge required to inform criticism and make discussion constructive. . . . The black-out must be lifted and the windows opened. Now is an appropriate occasion for a systematic review of the form and contents of the ' traditional ' Government publications. Many of the familiar peace-time reports would be more welcome if they betrayed a better sense of the important and the unimportant, and if they contained more evidence of statistical competence and more regard for scientific method."

All these arguments apply with increased force now that we must expect the Civil Service to play an even larger part in public affairs. The Animal Health Division has many important tasks to perform ; none is more important than the publication of reports containing the statistical and other information without which there can be no informed discussion on policy. Statistical help is available and we look forward with confidence to an early appearance of the Annual and other reports in an improved form supported by papers in the usual scientific journals.

[1] July 25th, 1945.

[2] Steward (1945). *Vet. Rec.*, March 31st.

PELVIC FRACTURE IN STILBOESTROL-TREATED COWS

Stilboestrol implantations employed on quite a large scale in England were alleged to be responsible for numerous fractures of the pelvis in the treated cows and heifers. Seven such fractures, out of an unmentioned number, are reported by one author and 20 per cent. of all animals so treated by another author. The mechanism of the accident from the long continued use of this synthetic oestrogen is not explained, except that structural or chemical alteration of the bones and/or changes in their angular relations were suspected.—Abstract from *J. Endocrinol.* in *Exper. Sta. Rec.*, **92** (Feb., 1945): 259-260.

REVIEW

[Bacteria in Relation to the Milk Supply. By C. H. Chalmers, B.Sc., N.D.A. 3rd Edition. 272 pp. London: E. Arnold & Co. Price 8s. 6d.]

This book is intended primarily as a guide for the commercial bacteriologist and the author hopes that in its revised form it may be of value to medical officers of health, sanitary inspectors and others who are closely concerned with the control of the milk supply. It is divided into two main sections; the first contains a useful résumé of the tests employed for determining the cleanliness of milk; the chapter given over to the routine examination of water is meagre and fuller advantage could have been taken of the revised edition of "The Bacteriological Examination of Water Supplies" issued by the Ministry of Health in 1939. A short but informative chapter on taints and abnormal conditions in milk is followed by a longer one on the isolation and identification of micro-organisms from milk. The latter is poor; the bacterial nomenclature is out of date; the success of the methods described for the isolation and identification of some of the bacteria is open to question and the guidance given concerning the pathogens found in milk is insufficient. The control of dairy plant at the farm and at the creamery and the relevant Acts and Orders are dealt with, and a valuable account is given of the varying aspects of, and plant used in, the pasteurisation of milk.

General bacteriological technique is the theme of the second part of the book and is difficult to write about, for technique can only be learned at the bench.

The appendices contain useful lists of the composition of stains and of media and also the bacteriological standards for specially designated milk.

Information which is not easily obtained elsewhere can be found here, but some portions of the book need careful revision.

Questions and Answers

"Questions and Answers" will be published on alternate weeks.
The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.
Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.
All communications should be addressed to the Editor.

White Clover Poisoning

Q. CI.—*Is white clover poisonous for cattle at any state of its growth and, if so, what are the symptoms and treatment?*

A.—Assuming that the white clover concerned is *Trifolium repens* or one of its varieties, when first fed to cattle, particularly to young cattle, it is liable to cause impaction of the rumen and tympanites. This is more common after rain and whilst the clover is still wet. Artificial manuring increases the risk. Alsike clover (*T. hybridum*), which was introduced from Sweden and which grows wild in some parts of S.W. England, is definitely poisonous, producing tympany, salivation and excoriation of the mouth and teats. It is probable that the true source of the irritation is to be sought in the presence of a mould (*Uromyces apiculatus*?). White clover is less likely to cause tympany after it has blossomed. No specific active principle has yet been isolated from these clovers, but there is some evidence that under suitable conditions they may give rise to photosensitisation, particularly alsike.

The treatment of clover tympany necessitates use of the trocar and cannula in extreme cases or of a gag in mild cases. A trocar should always be at hand on the farm as cattle frequently die before professional aid can be obtained. A feed of dry hay before turning young cattle on to clover decreases the risk of acute tympany occurring. Animals should not be allowed to graze heavily on clover at first, but should be introduced to it gradually.

"Blaine" in Cattle

Q. CII.—*The condition of "blaine" is frequently met with in cattle and usually responds rapidly to, or resolves without, any treatment. What is the cause of the condition?*

A.—"Blaine" is regarded as an allergic condition, possibly a reaction to certain proteins or toxins derived from the alimentary tract, but the precise cause is usually obscure. It is more often met with during the early summer and is often associated with indigestion following a change of pasture. The pollen of various plants has been blamed as the causal factor.

The rupturing of "warbles" under the skin may cause an attack, as, for instance, when cows or heifers have been riding one another during oestrus or when bullocks in markets have been belaboured with sticks.

Examination of Herds

Q. CIII.—*Since the introduction of the Milk and Dairies Act, many herds are examined which have not been previously.*

What is the position when the L.V.I. finds the owner has "forgotten" to keep the animals in or when an address has been given incorrectly? Can the L.V.I. claim for mileage in these circumstances?

A.—A claim for mileage can be made. Under such circumstances as those indicated the Divisional Inspector or the Superintending Inspector of the area should be consulted.

Rest Period for Bitches

Q. CIV.—*I find that a belief exists in the greyhound racing fraternity in this district, that it is necessary to rest a bitch after being in season for approximately 14 weeks, this period being calculated from eight weeks' pregnancy and six weeks to suckle the puppies. It is difficult to see why a non-gravid bitch should require such a long period. I would be grateful if you could explain if there is any scientific basis for this.*

A.—This belief exists in *all* districts and not only in that of your questioner, because it has been found that for a period of 12 to 16 weeks after oestrus a bitch would be appreciably slower over a measured distance. Such bitches frequently are lactating for varying periods and under those circumstances would not be showing their true form. Moreover, many trainers are quite confident that it would be harmful to train and race bitches within at least nine weeks after oestrus; some extend the rest period to 16 weeks, and in any case the N.G.R.C. enforce in "Rules of Racing, 1943," that "No bitch may take part in any race or official trial while in season or within such period after coming in season as, in the opinion of the racing manager the bitch shall be unable properly to be graded or raced."

A bitch's best form is never reached until mammary activity has entirely ceased. Your questioner has surely erred regarding the gestation period.

* * * * *

Correspondence

Beta haemolytic streptococcus *Infection of Dogs*

Sir,—In writing their letter (in your issue of June 16th, 1945, page 295) Professor F. C. Minett and Mr. Lakshmi Sahai appear to have had in mind the specific contagious infection of dogs due to the *beta haemolytic streptococcus*. They state, immediately following a list of names, which was headed by those of Professor H. J. Stafseth and his colleagues of the Michigan State College, U.S.A.—"the work of all these investigators shows that in the dog there does exist beyond reasonable doubt a pathological condition caused by haemolytic streptococci and that this condition appears under various clinical manifestations. . . ." From their statements it might be inferred that Professor Minett and Mr. Lakshmi Sahai wish to confer upon the American publication of 1937 priority over the two papers published in *The Veterinary Record* of 1938.

The paper by Professor Stafseth and his colleagues (*J. Amer. vet. med. Ass.* (1937.) **90**. 769) was entitled "Streptococcic Infections in Dogs. I: Acid Milk, Arthritis and Post-vaccination Abscesses." The authors had isolated various species of streptococcus from 29 of 44 "apparently healthy males and females, diseased adults, and dead or moribund pups." "The pups were examined mainly for the purpose of ascertaining the cause of pup mortality, thought by many dog-raisers and even veterinarians to be due to acid milk." "We do not claim that we possess proof of the aetiological importance of streptococci in early pup mortality. We believe, however, that in view of our findings there seems to be far more evidence of infection being the cause of repeated loss of litters by some dams than that acid milk has anything to do with it." "It is too early to attempt to evaluate the role of the various organisms encountered, but the one streptococcus [a haemolytic streptococcus] which was so frequently isolated from the female genital tact and which seemed to exhibit such a marked invasive power in pups, may be at least partly responsible for early pup mortality." "It is, of course, possible that some of the other streptococci isolated may be pathogenic canine strains, but we have not had time to study them in sufficient detail to justify any attempts at classifying them."

It seems to me that, in 1937, Professor Stafseth and his colleagues had arrived at the stage of indicating that various species of streptococcus are recoverable from dogs and that they, or some of them, may have pathogenic significance. Similar notions have been expressed by others during the preceding 30 odd years.

The two papers in *The Veterinary Record* of 1938 struck a new line of thought. They defined the specific canine disease due to *a particular* species of streptococcus and sketched a composite picture of the epidemiology, pathology and protean symptomatology

of this *beta haemolytic streptococcus* infection. And, I submit, sir, they were the first investigators to do so.

I have the honour to be, Sir,
Yours obediently,
TOM HARE.

London.
August 7th, 1945.

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Scientific Films

Arising out of the publication of the question and answer relative to the above published in our issue of June 16th (p. 295), Dr. Brian Stanford, Hon. Secretary of the Medical Committee of the Scientific Film Association (c/o The Royal Photographic Society, 16, Princes Gate, London, S.W.7), forwards a list of films of veterinary interest prepared by the Association, adding that the Association is considering the formation of a veterinary committee to help veterinary film users (who have so far been catered for by the Medical Committee) and that he would be pleased to hear from veterinarians interested in the project. The Association is a voluntary, non-profit-making organisation.

The list, which, it should be noted, is a preliminary one only and contains a number of films no longer available, classifies the films concerned into the following sections: Chemistry, physics, botany and zoology; physiology, biochemistry, histology; embryology; pharmacology (including anaesthesia); pathology; bacteriology; entomology, protozoology and helminthology; animal husbandry (including films on milk, animal genetics, sanitation, British breeds of livestock, food inspection); veterinary medicine; veterinary surgery; diseases of man of interest to veterinary students; comparative zoology.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Aug. 25th.—Summer Meeting of the Society of Women Veterinary Surgeons at Liverpool Veterinary Field Station, "Leahurst," Windle Hill, Neston), 2.15 p.m.
Aug. 30th.—Annual Meeting of the Lincolnshire and District Division, N.V.M.A., at Lincoln (Saracen's Head Hotel), 2 p.m.
Sept. 15th.—Applications due for Miss Cust Research Scholarship.
Sept. 19th.—R.C.V.S. Committee Meetings.
Sept. 20th.—R.C.V.S. Committee Meetings.
Sept. 21st.—**R.C.V.S. Council Meetings.**
Sept. 26th.—Meeting of the Association of Veterinary Inspectors, Conway Hall, W.C.1, 3 p.m.
Sept. 25th-28th.—**N.V.M.A. Annual Meetings, 1945: See detailed provisional programme announcement on page vii.**

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N.V.M.A. Memorandum on Farm Buildings

Pending revision of the above Memorandum a further small reprinting has been made to meet immediate demand. Copies are available on application to 36, Gordon Square, London, W.C.1.

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AGRICULTURAL RESEARCH COUNCIL

Development of Research in Animal Breeding and Genetics in Great Britain

The following announcement regarding the appointments of Professor R. G. White and Dr. C. H. Waddington to the Scientific Staff of the Agricultural Research Council for the preparation of a scheme for the creation of a national organisation for research in animal breeding and genetics, has been issued this week by the Agricultural Research Council.

As part of the survey which the Agricultural Research Council in conjunction with the Agricultural Improvement Councils for England and Wales and Scotland have been making of fields of research in which expansion is needed, special attention has been given to animal breeding and genetics, as a subject of outstanding importance. After considering advice on developments in this field given to them by a special Survey Group, for which the U.S.A. Government generously made available the services of Dr. R. T. Clark, of Montana, and after consultation with the Departments of Agriculture, the Agricultural Research Council have appointed to their scientific staff Professor R. G. White, Professor of Agriculture in the University College of North Wales, Bangor, and Dr. C. H. Waddington, of the Department of Zoology, Cambridge University. Their first task will be to prepare a scheme for the creation of a national organisation for research in animal breeding and genetics, covering the needs of Great Britain.

In this new organisation Professor White will be Director and Dr. Waddington Chief Geneticist.

It will be necessary for Professor White and Dr. Waddington to investigate the systems adopted in other countries for the development of research in this field, so that a complete scheme cannot be ready for some time, though certain investigations of a statistical and fundamental character can be started in the near future. It cannot, of course, be indicated at present what centre or centres will be chosen for the development of research. The Council are, however, anxious that in any new developments full advantage should be taken of the experience of the Institute of Animal Genetics at the University of Edinburgh, which for so long has contributed to knowledge of these subjects and has been the centre of post-graduate training for workers from many countries.

Similarly, it is the Council's intention that by close co-operation with practical breeders and the representatives of the agricultural industry throughout Great Britain, as well as with Milk Marketing Boards and other interested organisations, arrangements shall be made whereby records are kept in such a form as to give the greatest measure of assistance to research workers in the new organisation and to be of real value in guiding the improvement of livestock.

Research on such slow breeding animals as farm stock must necessarily be lengthy, and results which can be applied with confidence in breeding practice cannot, therefore, be expected to emerge quickly.

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PERSONAL

University College of Wales Department of Animal Health Appointments.—Mr. Richard Phillips, M.Sc. (Wales), A.R.I.C., formerly Senior Lecturer in Agriculture, has been appointed to the Department and will undertake research in animal husbandry and the administration of investigational centres. Dr. William Charles Evans, M.Sc. (Wales), PH.D. (Vict.), at present Biochemist to the Inoculation Department, St. Mary's Hospital, London, has been appointed Special Lecturer in Biochemistry. Mr. E. Parker Pollard, B.Sc. (Lond.), has been seconded by the Cooper Technical Bureau for research in parasitology and Mr. D. N. Fidler, B.Sc. (Wales), has been appointed Research Assistant (Animal Husbandry).

. . . . .

Mr. Tom Williams, the Minister of Agriculture, has appointed Mr. J. Hensley to be his Private Secretary and Mrs. J. E. Thorpe to be his Assistant Private Secretary.

The Earl of Huntingdon, Parliamentary Secretary, has appointed Mr. L. A. Jones to be his Private Secretary.

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R.C.V.S. OBITUARY

BURRISS, Robert, Capt., late R.A.V.C., Mountain View, Cloughjordan, Co. Tipperary. Graduated Dublin, July 22nd, 1922. Died July 16th, 1945.

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Our readers will sympathise deeply with Mr. Cyril King and Mr. Nevill King in the further bereavement they have sustained in the death of their mother, after a long and trying illness, borne with great fortitude, so soon after the passing of Mr. Herbert King, M.R.C.V.S. It was requested that, in lieu of flowers, donations be sent to the Secretary of the Victoria Veterinary Benevolent Fund, 9, Red Lion Square, W.C.1.

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ADDRESSES OF DISEASE-INFECTED PREMISES

SWINE FEVER:

Glam.—Rhyd-ddu-fach, Cefnbrynbrain, Cwmllynfell, Swansea (Aug. 15th); 4, Clees Lane, Ystalyfera, Swansea (Aug. 17th).

Glos.—The Paddocks, Siddington, Cirencester (Aug. 15th).

Herts.—Valley View Farm, Oxley Lane, Watford Rural, Watford; Hillmead Farm, Penman's Green, Sarrat, Rickmansworth (Aug. 14th); Paynes Farm, Croft Lane, Norton, Letchworth (Aug. 15th); Great Plummers Farm, Peters Green, Kimpton, Hitchin; Cannons Farm, Ansells End, Kimpton, Hitchin (Aug. 18th).

Hunts.—Lyndhurst, Pondersbridge, Huntingdon (Aug. 17th); Herne Road, Ramsey St. Mary's, Huntingdon (Aug. 20th).

Kent.—The Chequers, West Farleigh, Maidstone (Aug. 14th); Hollyville Café, Kingsdown, Sevenoaks (Aug. 17th); Hadleigh Piggeries, Hever Road, Kingsdown, Sevenoaks (Aug. 20th).

Lincs.—No. 10 Holding, Bridge Road, Sutton Bridge, Holbeach (Aug. 14th); 164, Bridge Road, Sutton Bridge, Holbeach (Aug. 20th).

Midlothian.—Bridgend, Craigmillar, Edinburgh (Aug. 14th).

Mon.—The Elms, Sedbury Lane, Sedbury, Chepstow (Aug. 14th).

Suffolk.—Old Hall, Debenham, Stowmarket: Friday Street, Park Farm and Bargate Farm, West Row, Bury St. Edmunds (Aug. 15th);

The Orchard and 72 and 125, Park Road, West Row, Bury St. Edmunds (Aug. 20th).

Surrey.—Luddington House, Stroude Road, Egham (Aug. 15th).

Wilts.—Home Farm, Allington, Devizes (Aug. 20th).

Yorks.—12, 13 and 14, Allotments, High Clarence, Middlesbrough (Aug. 17th); Gledhow Hall Gardens, Lidgett Lane, Leeds, 8 (Aug. 18th).

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LEGAL NOTES

Tuberculosis Order Offences.—A fine of £20, with costs 29s. 6d., was imposed by the Chelmsford Justices on Joseph Corbett, of Gordon Road, Romford, for possessing tuberculous cows, failing to notify the police, and failing to isolate the animals.

Mr. Philip Harvey, M.R.C.V.S., veterinary inspector, said he saw five cows, belonging to Mr. Corbett, in Chelmsford Market. Two were coughing continuously and were in poor condition. An examination showed that three were suffering from tuberculosis, and they were slaughtered.

Corbett said he bought two cows from a neighbouring farmer, put them with three others, and sent them to market the following day. He had no idea that any of them were suffering from tuberculosis.

The Mayor, announcing the fine, said the public must be protected. If they saw, as he did, the amount of meat that was condemned because of tuberculosis, they would be appalled.

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Pet Store Keeper Fined.—During the early heat wave in May (reports *The North London Press*) a veterinary surgeon saw a monkey, four puppies and four kittens untended and unhappy in the window of the Noah's Ark Pet Store, Hampstead Road, Camden Town. The shop was shut, but after consulting another veterinary surgeon he called a police officer and they broke into the shop to attend to the animals.

At Clerkenwell the shopkeeper, Arthur Thomas Moore, pleaded guilty to causing unnecessary suffering to the animals and was fined £10 and five guineas costs.

Mr. Gordon Chas. Knight, M.R.C.V.S., said the monkey was in a parrot's cage and appeared to be in a state of collapse. The puppies and kittens were in cages on either side and seemed very distressed. In his opinion, they were all suffering from heatstroke. There was no water in the window and the atmosphere in the shop was stifling. Efforts were made to revive the monkey, but it died.

Mr. Stuart Horner, counsel for the defence, said Moore bought the monkey only a few days before for £25. He had left the shop, intending to return later, and did not leave water in the window because the animals would have fouled it. The heat was quite exceptional for the time of year and he did not anticipate the effect it had.

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LABOUR POLICY FOR AGRICULTURE

Mr. Tom Williams, Minister of Agriculture and Fisheries, who was accompanied by Lord Huntingdon, Parliamentary Secretary to the Ministry, holding his first Press conference as Minister, said that it was his intention and that of the department to do what they could to avoid sudden and drastic changes of policy.

There was, said the Minister, nothing very mysterious or sensational about the Labour Party's agricultural policy: it had been public property for a long time. It was their intention, so far as food production in this country could help, to do all in their power to see that the people were properly fed and that farmers, farm workers and fishermen who played their part received a fair and reasonable reward for their efforts. Experience had taught him that if agriculture needed one thing more than anything else it was continuity and stability of policy. They could not take agriculture out of politics, but perhaps they could prevent it from becoming the plaything of politicians and prevent sudden and drastic changes in policy. In a reference to milk supplies, Mr. Williams said that the policy of attempting to up-grade our herds was already expressing itself; we were now receiving more milk from better quality animals, although there were, perhaps, fewer of them. Labour in agriculture was still a very great problem, but they were doing their best to resolve it. It was the biggest single problem at harvest time.

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A famous herd of Guernseys belonging to Lord Iveagh was among 1,888 cattle, sheep and pigs destroyed in the last few weeks from 16 farms in the Woking area infected with foot-and-mouth disease.

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FAT IN THE DIET OF THE DAIRY COW

The unprecedented demand for fats and oils in the Army, in industries, and in households, has aroused the interest of dairymen and feed manufacturers as to the question of fat requirements of milk cows. The present feed of cows contains but 2·00 to 2·75 per cent. of fat as compared with 3·50 to 4·50 per cent. of fat in pre-war years. The problem before nutritionists is to determine how much fat must be left in manufactured feeds to fulfil the requirements for milk production, in terms of fat, not of carbohydrate. The former belief that fats *per se* are of no particular value in dairy cow feeding has been proved erroneous by controlled trials showing a relationship between the intake of fat and the output and quality of butterfat. Cows receiving fat levels from 0·7 to 7·5 per cent. were used to make the differentiations. Disagreements in this connection appear to be due to the use of different fats and oils, some of which may even decrease milk production. The problem is of both economic and physiologic importance and its fundamental approach involves even more than feeding trials and digestion and absorption studies, especially where the source of fat is carbohydrate rather than fat itself. On the economic side lies the fact that if less fat (oil, meals, etc.) does not materially lower butterfat production, the nation's fat and food supply would be the gainer. The figures run high, since the 23,000,000 milk cows in the United States consume 18,000,000 tons of grain mixtures containing vast quantities of fats (oils) needed for industrial, specialised and human diet purposes.—*Nutrit. Rev.*, July, 1944.

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MINISTRY OF AGRICULTURE NEWS SERVICE

The British Council and Agriculture.—During the past ten years the British Council has done much to encourage an exchange of knowledge between countries, and its youngest section, that of agriculture, is fully aware of its responsibility. Already several booklets, telling the world what our farmers have been asked to do and have done during the past five and a half years, have been translated into Arabic, Dutch, French, Portuguese and other languages for distribution in the countries concerned.

In co-operation with the Ministry of Agriculture, the Scottish Department of Agriculture, Universities, War Agricultural Executive Committees and the National Farmers' Union, the Council has arranged many successful "leave" courses for agriculturists in the Dominions and the United States Forces. These courses include lectures, discussions and visits to farms and agricultural institutions.

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New Sheds for Old.—Messrs. E. B. & F. Watson of Utcoate Grange Farm, Woburn, Beds., have reconstructed a cowshed by pulling down the old wooden walls and substituting for them hollow concrete blocks. Each block takes the place of twelve bricks and the whole job has been done without disturbing the original foundations.

The interior has been cement-faced and painted, to give a light and cleanly appearance. Labour was supplied mainly by unskilled prisoners of war.

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World Food Shortage and Biological Science.—While much can be done to increase food production by a more world-wide introduction of modern equipment and methods, these alone cannot raise the output to meet requirements. Good husbandry is not only a matter of getting as much as possible out of the soil, but of putting back what has been taken out. Soil has a life of its own, and the maintenance of fertility is not purely a matter of keeping up the concentration of certain chemicals. Certain organisms acting on the organic matter in the soil play an important part in the making of humus, but others are injurious to plant life. More information is needed on the utilisation by the plant of the available plant food in the soil. Further knowledge is required in certain parts of the world on the methods of restoring eroded soil to a fertile state and the prevention of further damage.

Great improvements in food supply have been brought about by the introduction of food plants from one country to another. The soya bean is now supplying fat and protein to ever-spreading areas of the world. To-day the main line of advance lies in the improvement of existing strains of food plants—the breeding of wheats resistant to disease or strains that will ripen in the short summers of high latitudes. The advance in both plant and animal breeding has now reached a stage where the breeder understands what must be looked for—a good return in calories, proteins, vitamins and minerals.

In the world of organic chemistry a whole arsenal of compounds is now available for killing pests and diseases of plants and animals. Not the least of these are the organic-mercury compounds for certain seed-borne cereal diseases and the insecticide "dichlorodiphenyltrichlorethane" otherwise D.D.T. This substance has recently been used against malaria in East Africa, low flying planes being used to spray mosquito breeding grounds. The insecticide, however, has not as yet been released for general use.

These few examples show that, if the world's food is to be increased, full use must be made of the whole field of biological science in addition to improvement in methods and equipment.

Manurial Value of Feeding-Stuffs.—Before the war 8,200,000 tons of imported feeding-stuffs were used annually on our farms. These imports contained three times as much nitrogen as in all the nitrogenous fertilisers used on the land, as much phosphoric acid as in the total amount of superphosphate used and nearly as much potash as in all the potash fertilisers.

The land should, therefore, have received large amounts of additional plant food from the manurial residues of the feeding-stuffs. How much of this additional plant food eventually reached the crop depended largely on the way in which farmyard manure was made and used.

On many farms most of the nitrogen and potash went down the drain. This was due not only to insufficient care being given to the storage of farmyard manure, but to the time that was often allowed to elapse between the heaping and spreading on the field and the actual ploughing in. Some stock and dairy farmers had too little arable to allow the manure not used to give good returns.

In Denmark the liquid manure was collected separately and used directly on the land. This liquid manure alone supplied twice as much nitrogen and four times as much potash as were used in fertilisers.

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BOVINE TUBERCULOSIS ERADICATION IN U.S.A.

In a recent issue, *Veterinary Medicine* (Chicago) quotes Mr. H. R. Smith, General Manager of the National Livestock Loss Prevention Board, as follows: "Federal Meat Inspection records, which give us a true picture of conditions, show that in 1916, the year before the national tuberculosis eradication campaign was started, 2·35 per cent. of all cattle slaughtered had tuberculous lesions as compared with 0·96 per cent. in 1908, increasing two-and-a-half times in the eight year period. If nothing had been done, and if it had continued to increase at the same rate to the present time, to-day 50 per cent. of our cattle would be infected with the disease. But the situation was brought to the attention of legislative bodies and something *was* done. With adequate appropriations from Congress, state legislatures and county boards, and with an efficient army of veterinarians ably directed by federal and state sanitary officials, tuberculin testing was done so thoroughly that by 1943 only 0·048 per cent. of all cattle slaughtered under federal inspection showed lesions and were retained for the disease—a reduction of 98 per cent. from the 1916 figure. The number of beef carcases condemned has been reduced from 40,746 in 1917, or 0·44 per cent. of the total kill, to 1,248, or 0·01 per cent. in 1943—also a reduction of 98 per cent. In Chicago the reductions have been 99 per cent. in each case."

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U.S. BUREAU OF ANIMAL INDUSTRY INSPECTIONS

In supervising the interstate transportation of livestock to prevent the spread of diseases, veterinary inspectors of the U.S. Bureau of Animal Industry, last year, safeguarded the health of more than 23,412,083 cattle, 28,150,427 sheep, and 45,152,111 swine. This number considerably exceeded that of any previous year. Most of the inspections were conducted at the 48 principal stockyards of the country. A recent report by Dr. A. W. Miller, chief of the Bureau, shows the extent of the veterinary duties performed in handling the flow of livestock.

Cattle and sheep dipped to control injurious parasites numbered 290,615. In addition, 438,166 swine were immunised against cholera, preparatory to their distribution for feeding or breeding purposes.

Veterinary inspectors also supervised the cleaning and disinfection of large numbers of railroad cars and trucks that had carried animals affected with disease. They performed many other duties including the segregation and control of cattle that had reacted to tests for brucellosis and tuberculosis. The inspectors also examined all ruminants and swine for foot-and-mouth disease, no case of which was found.—*J.A.V.M.A.*

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CANARY MALARIA

An outbreak of malaria in a canary aviary reported by Beaudette, of the New Jersey Agricultural Experiment Station, is the second reported from that State in 1944. Harmon diagnosed malaria in canaries in California in 1942 and Manwell (cited by Beaudette) recognised avian malaria in 1938 (*Amer. J. Trop. Dis.* **18**. 565-575). The outbreak described by Beaudette occurred in August, 1943, in an aviary of 75 young canaries hatched in March and 25 adults caged out of doors. Isolated organisms from the liver were found to be *Plasmodium cathemerium*. Exclusion of mosquitoes from the cages stopped the outbreak immediately except for ten deaths obviously due to improper feeding or unknown causes. Both Harmon in California and Hudson in New Jersey isolated *P. cathemerium* in their investigations.—*J. Amer. vet. med. Ass.*, August, 1944.

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CATTLE CENSUS IN KENYA

An important cattle census is taking place in Kenya where the livestock of the Nandi people is being counted at an average of about 1,700 a day. A census has always been bitterly opposed in the past, but full explanations of the necessity of the count to the tribal elders have now been accepted and they are fully co-operating in the work. The attitude of the Nandi people to progress generally has undergone a great change in recent years and the Local Native Council is offering a site for the proposed Teachers' Training School. —*Colonial Office News Service.*

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THE SALE OF PROPRIETARY MEDICINES

In its issue of August 18th *The Pharmaceutical Journal* prints a full summary of a paper on the above subject presented to the Medico-Legal Society by Mr. N. H. Linstead, Secretary of the Pharmaceutical Society.

It must be accepted, said Mr. Linstead, that most of the proprietary medicines now on the market were sound remedies with honest pretensions to relieve the ailments for the treatment of which they were advertised, but while the general quality of the medicines themselves was high, there were still medicines which were straightforwardly worthless and for which there was no good word to be said. The makers of these medicines owed their immunity from prosecution largely to an exception in the Food and Drugs Act, 1938. The composition of the medicines was in some few cases open to criticism, the price at which some were sold to the public was grossly excessive, but the real field within which a substantial measure of reform was still waiting to be carried through was that of the advertising of these medicines. Here there was deception and fraud, to say nothing of gross exaggeration.

The chief of the evils still rampant in the sphere of advertising were offers to diagnose from information supplied by the patient on a form sent through the post, the use made of testimonials, attacks on orthodox medicine, extravagant claims, the appeal to fear and the custom of gradually reducing fees if the would-be patient was not immediately responsive. Both the Proprietary Association of Great Britain and the Advertising Association had initiated reforms in this direction.

Section 11 of the Pharmacy and Medicines Act, 1941, which required the disclosure on the label of the active ingredients of substances recommended as medicines, had been beneficial. The section could be said to have achieved its object, but there was still a certain number of medicines of which the composition was not adequately disclosed, either by reason of ignorance on the part of the manufacturer or a deliberate desire to be as secretive as possible. The Pharmaceutical Society had been steadily reducing these cases by representations to the manufacturers or by prosecution.

The basic remedy for the evils of the proprietary medicine trade was education. If the population as a whole were to develop a more critical attitude of mind to the claims made for the remedies, the wiles of the copywriter would not snare them. Much could be done by voluntary effort, but there were limitations. One was forced to the conclusion that the Ministry of Health must soon accept the responsibility, which was clearly theirs, for seeing that only genuine medicines, advertised without exaggeration, were made available to the public.

Among the necessary reforms mentioned by Mr. Linstead were the following:—

(1) An enquiry by the Government or by Parliament into the present extent of the proprietary medicine trade with particular reference to its relationship to a National Health Service.

(2) Continued efforts by the manufacturers of proprietary medicines through the Proprietary Association of Great Britain and by the newspapers and advertising agents through the Advertising Association to impose an increasing standard of good practice within the industry.

(3) A perpetual educational campaign by the Ministry of Education and by the Ministry of Health to bring home to the citizen his responsibility for his own good health and the means to achieve it.

(4) Pending the introduction of more comprehensive legislation, the amendment of the Pharmacy and Medicines Act, 1941, in (*inter alia*) the following respect: To prohibit advertisements referring to the "treatment" as well as to "articles for the treatment" of the diseases referred to in section 8 (which prohibits the advertising of articles for the treatment of certain diseases). To prohibit invitations to diagnose by correspondence.

H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net	Post free
WAR OFFICE:		
Allowances of the Army, Regulations for, 1944. Amendment No. 8, June 30th, 1945	0 1	0 2
STATUTORY RULES AND ORDERS, 1945:		
E.P.942. Livestock. Import from Eire and the Isle of Man, Regulations, August 1st	0 2	0 3
949. Animal. Diseases of Animals. Importation of Dogs and Cats (Amendment) Order. July 4th	0 1	0 2

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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RECURRENT TETANY IN THE DOG

Sir,—The clinical communication by Mr. R. H. Smythe on a condition which he designates "recurrent tetany" is extremely interesting. I have seen a number of these cases, which are quite characteristic, always in Scottish terriers. I have not so far had Mr. Smythe's opportunities for studying its hereditary features, but, as he says, breeders are well aware of its incidence and of its hereditary nature. It is to be hoped that Scottish terrier breeders are sufficiently progressive to take steps to eliminate at least one of the diseases to which the modern Scottish terrier is heir.

The aetiology of the condition is obscure, but I had regarded the condition as one of local circulatory failure and to me it would seem to have some characters in common with Raynaud's disease in man. It is interesting to note that Mr. Smythe has controlled the disease by phenobarbitone, and this would suggest that the disease is neuro-vascular in nature, symptoms being due to prolonged arterial spasm. I should be interested to know whether sympatheticectomy has ever been attempted in this condition? Presumably lumbar sympatheticectomy is indicated, and I shall certainly attempt this treatment if a suitable case presents itself.

Yours faithfully,

JOAN O. JOSHUA.

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COLLEGE PLACES FOR RELEASED PERSONNEL

Sir,—A number of letters have recently appeared in your columns rightly emphasising the difficulties of members on release from H.M. Forces, and advocating various measures to bring their knowledge up to date. A somewhat similar difficulty has just been brought to my notice—that of young men at present serving in H.M. Forces and expecting early release who wish to enter one of the colleges as students. A young man at present serving in the Navy writes me that one of the colleges informs him it has no vacancies until 1948. If this position obtains at other colleges, it seems to me that the matter is *most* serious, as I feel that those who have lost four or five years' start through their service in the Forces should be given every opportunity of joining the profession of their choice, even, perhaps, through postponement of entry of younger men if places could be found in no other way.

Yours faithfully,

Chipping Norton, Oxon. PAUL CROSFIELD.
August 12th, 1945.

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VETERINARY EDUCATION

Sir,—As one who has repeatedly endeavoured to focus attention upon the need for the profession to examine its present system of education in order to see whether a change in this system is likely to lead to improvement in the training of veterinary students and in higher veterinary service to the nation, I welcome Mr. Lishman's belated request that "this correspondence in so far as it relates to the one-portal aspect of veterinary education will now cease—in order that the Loveday recommendations may be discussed."

As I have previously stated, most of us are not interested in definitions but are more concerned with realities and with the attainment of the best conditions for our training and work in the present and future. In the opinion of a growing number of us these conditions can best be secured within the universities, provided we take steps to co-operate with them. In view of the real issue before us even Mr. Lishman surprised me with his naïve view that the question "of whether veterinary education within the universities or the affiliated schools would be better" is a "totally irrelevant matter." This astonishing statement, especially if taken in conjunction with one made recently by an equally die-hard colleague, Dr. Tom Hare, who at a recent meeting of Council, R.C.V.S., averred that the *medical* profession had the strongest one-portal system of entry in the world, clearly indicates the futility of continuing a discussion upon the meaning of the term "one-portal."

It is difficult to make short reference to the involved letter of Dr. Edwards, particularly as he tries to assess university education by an examination which is the very antithesis of that education. One is amused at his attempts to imply that veterinary education at Liverpool University was less efficient than at other centres although the student material was good, the teachers were of high distinction and later achievement by Liverpool graduates has been in no way inferior "as has been abundantly testified." Surely these points made by Dr. Edwards indicate that there is a second deduction which can be drawn equally logically from the table of R.C.V.S. prize results he gives, namely, that an examination system which apparently fails to select such merit as is later so abundantly testified must indeed be a bad system of education.

But let us consider the R.C.V.S. examination system, ignoring for the moment the many highly important general reasons why we should aim at veterinary education within the universities. It must be admitted that the M.R.C.V.S. examination suffers from many defects, of which we might mention the following:—

(1) The number of candidates now requiring to be examined has caused the period of examination to be seriously prolonged.

(2) This excessive length of examination automatically precludes many members of the profession from finding the time for such important but yet to them secondary tasks as examining for the R.C.V.S.

(3) This severe limitation of numbers of applicants for examinerships restricts the choice of the Council and often leads to the continued reappointment of individuals for unduly long periods of years.

(4) Educational authorities agree that the continuance of groups of examiners over long periods without change tends to limit progress.

(5) The heavy demands upon the time of examiners during the period of the R.C.V.S. examinations leads to unsatisfactory conditions for the marking of some of the written papers and occasionally for the conduct of orals.

(6) The pressure of work and the imperative journeyings inevitably react upon the examiner, with the result that even standards of examination cannot be expected to be maintained throughout the tour. Even that energetic stalwart, Principal Buxton, recently told Council that he had been forced to relinquish the duty of acting as the observer at examinations on behalf of the R.C.V.S. because he found the physical and mental strain involved by the long tour so great. How much greater must be the strain upon the examiners?

(7) Busy practitioners giving up six or more weeks a year to the R.C.V.S. examinations find it an extremely difficult task to secure the leisure to keep themselves abreast of development in their subject.

(8) The lack of contact with courses of study and the teaching inevitably results in unsuitable questions being set from time to time.

(9) The short period of time during which examiner and examinee meet (not having known each other previously as teacher and student) makes it difficult to secure the conditions of ease so desirable for equitable oral and practical examinations.

(10) Student efficiency is judged without taking into account to any appreciable extent the very real test of student efficiency, namely, his reaction to his verbal and practical instruction throughout the course.

In considering whether we must retain at all costs our one-portal system won for us by our progressives of 100 years ago, we should appreciate that many of the defects mentioned above did not then exist and that the system of university education with its close association with scientific research was scarcely then developed.

Yours faithfully,

Bentley Hyde, W. R. WOOLDRIDGE.
Priory Drive,
Stanmore, Middlesex.
August 18th, 1945.